

# Row Column Phased Array Architecture for Low Cost, Low Profile Millimeter Wave Phased Array Antennas, Phase I

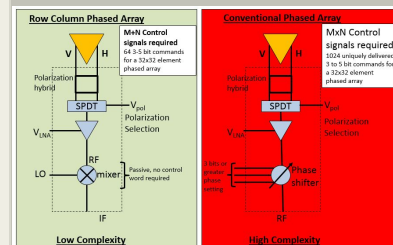
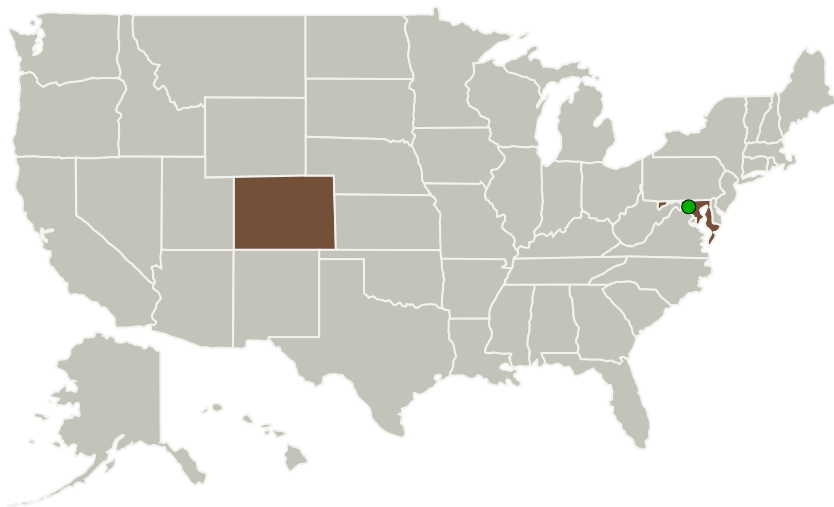
Completed Technology Project (2017 - 2017)



## Project Introduction

There is high demand for electronically steered antennas particularly at millimeter wavelengths. However, the cost to develop and procure this type of antenna prohibits this technology from widespread use. The proposed innovation substantially reduces the control complexity of phased arrays by reducing the control set from  $M \times N$  phase controls to  $M + N$  phase controls where  $M$  and  $N$  represent the number of rows and columns in the phased array. By reducing the control complexity, not only are the phased array devices simplified, but the control distribution network is substantially reduced. This simplification ripples across the entire phased array to improve physical integration and thermal management which often cost as much as the phased array components. This is particularly important for high frequency antennas where unit cell sizes become a significant impediment to system implementation. Another limitation in state of the art phased arrays are the conventional planar radiators that are easily integrated. A three-dimensional radiator and manufacturing technology is baselined to enhance the bandwidth and performance of millimeter wave phased array antennas. This combination enables significant opportunities to support multifunction operation.

## Primary U.S. Work Locations and Key Partners



Row Column Phased Array Architecture for Low Cost, Low Profile Millimeter Wave Phased Array Antennas, Phase I Briefing Chart Image

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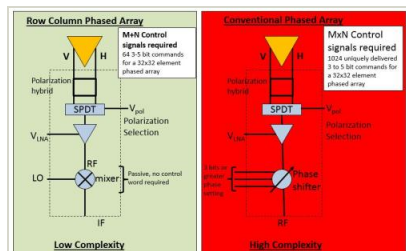


Organizations Performing Work	Role	Type	Location
Agile RF Systems, LLC	Lead Organization	Industry Women-Owned Small Business (WOSB)	
● Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

## Primary U.S. Work Locations

Colorado	Maryland
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## Images



## Briefing Chart Image

Row Column Phased Array Architecture for Low Cost, Low Profile Millimeter Wave Phased Array Antennas, Phase I Briefing Chart Image  
(<https://techport.nasa.gov/image/126136>)

## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Organization:

Agile RF Systems, LLC

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

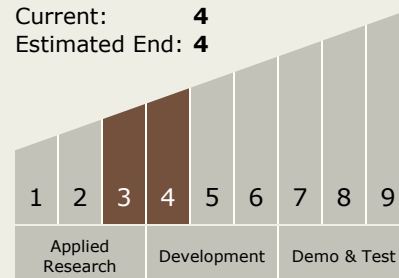
Carlos Torrez

### Principal Investigator:

Philip Kelly

## Technology Maturity (TRL)

Start: **3**  
Current: **4**  
Estimated End: **4**



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## Technology Areas

### Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  - └ TX05.2 Radio Frequency
    - └ TX05.2.4 Flight and Ground Systems